

June 6, 2001

Mr. Harold W. Keiser
Chief Nuclear Officer and President
PSEG Nuclear LLC - X04
P. O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK NUCLEAR GENERATING STATION - NRC INSPECTION
REPORT 50-354/01-06

Dear Mr. Keiser:

On May 12, 2001, the NRC completed an inspection of your Hope Creek facility. The enclosed report presents the results of that inspection. The preliminary findings were presented to PSEG Nuclear management led by Mr. Dave Garchow in an exit meeting on May 11.

NRC inspectors examined numerous activities as they related to reactor safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection consisted of selective review of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this inspection involved six weeks of resident inspection and one region-based inspection of the radiological environmental monitoring program and radioactive material control program.

Based on the results of this inspection no findings of significance were identified.

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Sincerely,

/RA/

Glenn W. Meyer, Chief
Projects Branch 3
Division of Reactor Projects

Enclosure: Inspection Report 50-354/01-06
Attachment: Supplemental Information

Mr. Harold W. Keiser

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cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No: 50-354
License No: NPF-57

Report No: 50-354/01-06

Licensee: PSEG Nuclear LLC

Facility: Hope Creek Nuclear Generating Station

Location: P.O. Box 236
Hancocks Bridge, NJ 08038

Dates: April 1 - May 12, 2001

Inspectors: Joseph G. Schoppy, Jr., Senior Resident Inspector
Christopher G. Cahill, PE, Resident Inspector
Jason C. Jang, Senior Health Physicist

Approved By: Glenn W. Meyer, Chief, Projects Branch 3
Division of Reactor Projects

Summary of Findings

IR 05000354-01-06, on 4/1 - 5/12/01 Public Service Electric Gas Nuclear LLC, Hope Creek Generating Station. Resident inspector report.

The inspection was conducted by resident inspectors and a regional radiation specialist. This inspection identified no findings of significance. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Findings

The inspectors did not review any licensee identified violations.

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Report Details

SUMMARY OF PLANT STATUS

At the beginning of the inspection period, operators maintained the unit at 80 percent power due to the projected solar activity. On April 2 operators restored power to 100 percent following turbine valve testing at 87 percent power. On April 7 operators performed a short duration power reduction to 93 percent for control rod exercising. On April 11 and April 18, operators performed emergent power reductions to 80 percent in response to high solar magnetic disturbance (SMD). On April 28 operators reduced power to 87 percent for planned turbine valve testing.

At 8:20 a.m. on May 8, operators declared the outboard main steam isolation valve (MSIV) sealing system inoperable when they discovered that an emergent issue (a failed primary potential transformer on the C 4160V vital bus) impacted the subsystem's emergency power supply. Operators concurrently entered TS 3.0.3 because they had previously declared the inboard MSIV sealing system inoperable on May 4 due to excessive moisture intrusion into the system. (Technical Specification 3.6.1.4 requires two operable independent MSIV sealing systems and specifies a 30 day allowed outage time for one inoperable system.) At 10:00 a.m. on May 8, operators initiated a plant shutdown to comply with TS 3.0.3. At 3:02 p.m. on May 8, operators inserted a manual reactor scram from 25 percent power to place the unit in Hot Shutdown. At 7:30 a.m. on May 9, operators placed the unit in Cold Shutdown. The unit remained in Cold Shutdown for the duration of the period.

1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)

R04 Equipment Alignment

a. Inspection Scope

The inspectors performed equipment alignment verifications on redundant equipment during an outage of the C emergency diesel generator (EDG). The inspectors verified by plant walkdowns and main control room tours that the planned equipment outage of the C EDG did not adversely affect the redundant EDGs or 4160V safety-related equipment. The inspectors also verified that the C EDG was restored to an operable condition after the planned maintenance was complete. Additionally, the inspectors reviewed two corrective action notifications associated with equipment alignment deficiencies (20063147 and 20065692) and a corrective action effectiveness review for root cause evaluation 70002072 (involving containment integrity isolation valve surveillances).

b. Findings

No findings of significance were identified.

R05 Fire Protectiona. Inspection Scope

The inspectors performed walkdowns of the high pressure coolant injection (HPCI) room, reactor core isolation cooling (RCIC) room, the C and D residual heat removal (RHR) pump rooms, and the core spray pump rooms. The inspectors reviewed Hope Creek's Individual Plant Examination for External Events for risk insights concerning these areas. Additionally, the inspectors reviewed the Hope Creek Generating Station Fire Impairment Tracking Report and several notifications associated with fire protection deficiencies (20063697, 20063764, 20063792, 20063934, and 20064113).

b. Findings

No findings of significance were identified.

R06 Flood Protection Measuresa. Inspection Scope

The inspectors reviewed notification 20063971 involving a flood protection issue.

b. Findings

No findings of significance were identified.

R07 Heat Sink Performancea. Inspection Scope

The inspectors reviewed notification 20062756 concerning heat exchanger performance.

b. Findings

No findings of significance were identified.

R11 Licensed Operator Requalificationa. Inspection Scope

The inspectors observed one simulator training scenario to assess operator performance and training effectiveness. The scenario involved service water grassing, a reactor protection system (RPS) motor generator (MG) set failure, a feedwater pump trip, and a feedwater line rupture in containment. The inspectors assessed simulator fidelity to the actual plant and observed the simulator instructor's critique of operator performance. The inspectors reviewed simulator evaluations for previously identified weaknesses and notification 20062432 involving a simulator training issue. The

inspectors also observed control room activities with emphasis on identified areas for simulator improvement.

b. Findings

No findings of significance were identified.

R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors reviewed all corrective action notifications initiated from January 1 to February 15, 2001, for maintenance rule screening. The inspectors further reviewed six notifications that included system engineer functional failure determinations (20052785, 20053101, 20053102, 20053795, 20055007, and 20056021). The inspectors also reviewed Hope Creek Expert Panel Meeting Minutes (HCEP 01-003, HCEP 01-004, and HCEP 01-006) and attended the Hope Creek Expert Panel Meeting (HCEP 01-005) conducted on April 26.

To assess PSEG Nuclear's implementation of 10CFR 50.65 *Maintenance Rule* requirements, the inspectors reviewed the following documents:

- SE.MR.HC.02, *System Function Level Maintenance Rule VS Risk Reference*
- NRC Regulatory Guide 1.160, *Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, Revision 2
- NUMARC 93-01, *Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*, Revision 2

b. Findings

No findings of significance were identified.

R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated on-line risk management for the following configurations: (1) the concurrent planned outage of C EDG and the AVH408 class 1E ventilation train during an A channel work week; and (2) an emergent issue (a failed primary potential transformer on the C 4160V vital bus) that impacted the C EDG and outboard MSIV sealing system concurrent with an inoperable inboard MSIV sealing system. The inspectors reviewed maintenance risk evaluations, work schedules, recent corrective action notifications, and control room logs to verify that other concurrent planned and emergent maintenance or surveillance activities did not adversely affect the plant risk already incurred with the out of service or inoperable components. In addition, the inspectors reviewed other notifications involving risk assessment and emergent work

(20061146, 20061195, 20061384, 20061556, 20062288, 20062526, 20062641, 20062643, 20063021, 20063231, 20063520, 20063826, 20064326, and 20065302).

To assess PSEG Nuclear's risk management, the inspectors reviewed the following documents:

- SE.MR.HC.02, *System Function Level Maintenance Rule VS Risk Reference*
- SH.OP-AP.ZZ-108, *On-Line Risk Assessment*
- HCGS PSA Risk Evaluation Forms for Work Week Nos. 13 - 18
- NRC Regulatory Guide 1.182, *Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants*
- Section 11, *Assessment of Risk Resulting from Performance of Maintenance Activities*, dated February 11, 2000, of NUMARC 93-01, *Industry Guideline For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants*

b. Findings

No findings of significance were identified.

R14 Personnel Performance During Nonroutine Plant Evolutions

.1 Technical Specification Required Shutdown

a. Inspection Scope

On May 8 operators initiated a plant shutdown to comply with TS 3.0.3. The inspectors observed operators' preparations for the plant shutdown, portions of the power reduction, the pre-evolution scram briefing, and control room operations associated with the manual scram initiated to place the plant in Hot Shutdown. Additionally, the inspectors reviewed HC.OP-IO.ZZ-0004, *Shutdown From Rated Power To Cold Shutdown*, and HC.OP-AB.ZZ-0000, *Reactor Scram*, to ascertain operator compliance and conformance to these procedures.

b. Findings

No findings of significance were identified.

.2 Unexpected Trip of the A Reactor Protection System Motor Generator Set

a. Inspection Scope

The inspectors reviewed operator actions in response to an unexpected trip of the A RPS MG set. The loss of the A RPS bus resulted in a RPS A1 and A2 half scram and nuclear steam supply shutoff system trip. It also tripped the A and B reactor water clean up pumps and isolated the recirculation sample line. The inspectors reviewed the operations logs, abnormal procedures entered, notification 20062179, and the Transient Action Response Plan (TARP) investigation report dated April 11, 2001. Additionally, the inspectors observed the pre-evolution briefing and control room operations associated with the restoration of the A RPS MG set.

b. Findings

No findings of significance were identified.

R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability determination for fire dampers 1FPGKD-263D2 and 1FPGKD-262D2 (order 70015431). The inspectors reevaluated engineering's previous operability determination for MSIV sealing system moisture intrusion (order 70000027) based on increased in-leakage into the inboard MSIV sealing system. The inspectors also reviewed all other PSEG Nuclear identified safety-related equipment deficiencies during this report period and assessed the adequacy of the operability screenings.

b. Findings

No findings of significance were identified.

R16 Operator Workarounds

a. Inspection Scope

The inspectors reviewed corrective action notifications, operator logs, and instrument panel status to evaluate potential impacts on the operators' ability to implement abnormal or emergency operating procedures.

The inspectors also reviewed the following documents:

- Condition Resolution Operability Determination Notebook
- Inoperable Instrument/Alarm/Indicators/Lamps/Device Log
- Inoperable Computer Point Log

- Hope Creek Operator Workarounds List
- Hope Creek Operator Concerns List

b. Findings

No findings of significance were identified.

R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the results of post maintenance testing (PMT) for preventive maintenance on the D RHR pump, emergent work on the motor driven fire pump, and emergent work on the C 4160V vital bus primary potential transformer. The inspectors reviewed NC.NA-TS.ZZ-0050, *Maintenance Testing Program Matrix*, to verify that the PMTs were adequate for the scope of the maintenance performed. The inspectors also reviewed notifications concerning problems associated with PMTs (20062553, 20062895, 20062898, and 20062899)

The inspectors reviewed the following documents:

- DP202, *D Residual Heat Removal Pump In-service Test* (HC.OP-IS.BC-0004)
- *Electric Motor Driven Fire Pump Operability Test* (HC.FP-ST.KC-0002)

b. Findings

No findings of significance were identified.

R20 Refueling and Outage Activities

a. Inspection Scope

On May 8 operators shut down the plant to comply with TS 3.0.3. During the forced outage the inspectors performed verifications of the cooldown rate, shutdown cooling flow paths, inventory control, offsite power availability, reactivity control, containment integrity, and equipment tagging. The inspectors evaluated PSEG Nuclear's shutdown risk management and configuration control, especially while the C 4160V vital bus was removed from service. The inspectors also reviewed notifications concerning problems related to the forced outage (20065326, 20065349, 20065382, 20065390, 20065402, 20065452, 20065508, 20065524, and 20065659).

The inspectors reviewed the following documents:

- *Decay Heat Removal Operation* (HC.OP-SO.BC-0002)
- *Outage Management Program* (NC.NA-AP.ZZ-0055)

- *Outage Risk Assessment (NC.OM-AP.ZZ-0001)*

b. Findings

No findings of significance were identified.

R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions of and reviewed the results of the B and D core spray pumps in-service test, the B control room emergency filtration system surveillance, and control rod scram timing. The inspectors also reviewed notifications concerning problems encountered during surveillance testing (20061547, 20061916, 20062699, 20062788, 20063601, 20064475, 20064578, 20064752, and 20065064).

The inspectors reviewed the following documents:

- *B & D Core Spray Pumps - BP206 and DP206 - In-service Test (HC.OP-IS.BE-0002)*
- *B-Control Room Emergency Filtration System Functional Test - Monthly (HC.OP-ST.GK-0003)*
- *Control Rod Scram Time Surveillance (HC.RE-ST.BF-0001)*

b. Findings

No findings of significance were identified.

R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed three notifications (20065119, 20065277, and 20065622) associated with temporary plant modification issues.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Public Radiation Safety [PS]

PS3 Radiological Environmental Monitoring

.1 Radiological Environmental Monitoring Program

a. Inspection Scope (71122.03)

The inspector reviewed the following documents to evaluate the effectiveness of PSEG Nuclear's Radiological Environmental Monitoring Program (REMP) at the PSEG Maplewood Testing Services Laboratory, Maplewood, NJ, and at the Salem/Hope Creek site. The requirements of the REMP are specified in the Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM).

Maplewood Testing Services Laboratory

- *1999 Annual REMP Report and 2000 Draft Report*;
- analytical results for 2001 REMP samples;
- most recent calibration results for all TS/ODCM air samplers;
- calibration results for gamma, alpha/beta, and tritium measurement instruments;
- *Maplewood Testing Services Laboratory Quality Assurance Manual*;
- implementation of the quality control program;
- 1999, 2000, and 2001 gamma, alpha/beta, and tritium quality control charts;
- interlaboratory and intralaboratory comparisons;
- environmental thermoluminescent dosimeters (TLDs) program;
- the Land Use Census procedure and the 2000 results; and
- associated sampling and analytical REMP procedures.

Salem/Hope Creek Site

- most recent *Salem ODCM* (Revision 14, December 12, 2000) and technical justifications for ODCM changes, including sampling media and locations;
- most recent calibration results of the meteorological monitoring instruments (November 2000 and February 2001) for wind direction, wind speed, and temperature;
- 1998, 1999, and 2000 meteorological monitoring data recovery statistics;
- *meteorological monitoring program self-assessment report* (Report Number NRP-01-007, February 16, 2001)
- QA Assessment Reports for the REMP/ODCM implementations (Report Numbers 2000-0106, 2000-0393, and 2001-0073)

The inspector also toured and observed the following activities to evaluate the effectiveness of PSEG Nuclear's REMP:

- observation for the operability of meteorological monitoring instruments at the tower and the control room;
- observation at PSEG Nuclear's analytical laboratory's activities, PSEG Maplewood Testing Services Laboratory;
- observation for air iodine/particulate sampling techniques; and
- walk-down for determining whether all air samplers, milk farms, and 25%TLDs were located as described in the ODCM (including control and indicator stations) and for determining the equipment material condition.

b. Findings

No findings of significance were identified.

.2 Radioactive Material Control Program

a. Inspection Scope (71122.03)

The inspector reviewed the following documents to ensure that PSEG Nuclear met the requirements specified for the unrestricted release of material from the Radiologically Controlled Area (RCA):

- most recent calibration results for the radiation monitoring instrumentation (small articles monitor, SAM-9), including the (a) alarm setting, (b) response to the alarm, and (c) the sensitivity;
- PSEG Nuclear's criteria for the survey and release of potentially contaminated material using a gamma spectroscopy (calibrations efficiency for bulk sample analyses);
- methods used for control, survey, and release from the RCA; and
- associated procedures and records to verify for the lower limits of detection for bulk sample analyses.

The review was against criteria contained in 10CFR20, NRC Circular 81-07, NRC Information Notice 85-92, NUREG/CR-5569, Health Position Data Base (Positions 221 and 250), and PSEG Nuclear's procedures.

The following PSEG Nuclear's activities were observed for the effectiveness of the material release program:

- observations for the use of SAM-9 at RCA access points; and
- testing for the alarm setpoint using a radioactive source.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES [OA]

OA2 Identification and Resolution of Problems

The inspectors reviewed numerous notifications associated with PSEG Nuclear's identification, evaluation, and resolution of problems without findings and are listed in Sections 1R04, 1R05, 1R06, 1R07, 1R11, 1R12, 1R13, 1R14, 1R15, 1R16, 1R019, 1R20, 1R22, and 1R23 of this report.

OA6 Management Meetings

a. Exit Meeting Summary

On May 11 the inspectors presented their overall findings to members of PSEG Nuclear management led by Mr. Dave Garchow. PSEG Nuclear management stated that none of the information reviewed by the inspectors was considered proprietary.

b. PSEG Nuclear/NRC Management Meeting

On April 4, Ms. Greta Dicus, NRC Commissioner, and Mr. Hub Miller, Region I Administrator met with members of PSEG Nuclear management; discussed regulatory issues during a working lunch; and toured the Salem and Hope Creek plants.

ATTACHMENT 1**SUPPLEMENTAL INFORMATION**a. Key Points of Contact

Terry Cellmer, Radiation Protection Manager
 Matt Conroy, Maintenance Rule Supervisor
 Mike Dammann, Maintenance Manager - Controls & Power Distribution
 Kurt Krueger, Operations Manager
 Devon Price, Assistant Operations Manager
 Gabor Salamon, Nuclear Safety & Licensing Manager
 Lou Santilli, Production Engineering Manager
 Larry Wagner, Director - Site Work Integration & Management

b. List of Items Opened, Closed, and Discussed

None

c. List of Documents Reviewed

In addition to the documents identified in the body of this report, the inspectors reviewed the following documents and records:

Main Power Transformer/Grid Disturbances (HC.OP-AB.ZZ-0152)
Hope Creek Generating Station (HCGS) Updated Final Safety Analysis Report
Technical Specification Action Statement Log (SH.OP-AP.ZZ-108)
 HCGS NCO Narrative
 HCGS Plant Status Report

d. List of Acronyms

EDG	Emergency Diesel Generator
HCEP	Hope Creek Expert Panel
HCGS	Hope Creek Generating Station
HPCI	High Pressure Coolant Injection
MG	Motor Generator
MSIV	Main Steam Isolation Valve
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PMT	Post Maintenance Testing
PSEG	Public Service Electric Gas
QA	Quality Assessment
RCA	Radiologically Controlled Area

RCIC	Reactor Core Isolation Cooling
REMP	Radiological Environmental Monitoring Program
RHR	Residual Heat Removal
RPS	Reactor Protection System
SMD	Solar Magnetic Disturbance
TARP	Transient Action Response Plan
TLDs	Thermoluminescent Dosimeters
TS	Technical Specification